

20. BÖLÜM / CHAPTER 20

COVID-19 and Surgery

COVID-19 ve Cerrahi

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ABSTRACT

Objective: The virus called SARS-CoV-2, which was discovered in China in December 2019, has become a pandemic today. New guidelines have been published on the approach towards surgical patients. However, it is still not clear how the surgical process should be during the pandemic period. While the article focuses on what needs to be done in the current surgical approach, it also seeks to highlight controversial issues.

Material and Method: A computer-based literature research was carried out using PubMed, European Society of Medical Oncology (ESMO), American Society of Clinical Oncology (ASCO) and American College of Surgeons (ACS).

Results: According to published norms, neoadjuvant chemotherapy is preferred before the elective cancer surgery. Research also demonstrates that patients should be tested for COVID-19 before surgery. It is very important to implement the necessary measures in the operating room. During surgery, it is controversial whether laparoscopic or traditional methods should be preferred.

Conclusion: The choice of surgical procedures, pre, and postoperative management of patients with malignancy has become even more important in the COVID-19 pandemic. In addition, much more research is needed to clarify surgical methods, pathological problems, and the effectiveness of new guidelines.

Keywords: COVID-19, surgery, breast surgery, endocrine surgery, gastrointestinal surgery, hepatopancreatobiliary surgery

ÖZ

Amaç: İlk olarak Aralık 2019'da Çin'de keşfedilen SARS-CoV-2 adlı virüs bugün bir küresel salgına sebep olmuştur. Bu süreçte birçok cerrahi hastalığın tedavisi ertelenmiş, acil ameliyatlardan dışarıda ameliyat yapılmamıştır. Ancak sürecin uzaması nedeni ile hangi hastaların ameliyata alınması gerektiği konuları daha da fazla önem kazanmıştır. Bu konuda bugüne kadar birçok kılavuz yayınlanmıştır. Ancak, cerrahi sürecin nasıl olması gerektiği hala net değildir. Bu makale, mevcut cerrahi yaklaşımda neler yapılması gerektiğine odaklanırken, tartışmalı konuları da aydınlatmayı amaçlamaktadır.

Gereç ve Yöntem: Bu çalışma için bilgisayar tabanlı bir literatür araştırması yapılmıştır. PubMed, Avrupa Tıbbi Onkoloji Derneği (ESMO), Amerikan Klinik Onkoloji Derneği (ASCO) ve Amerikan Cerrahlar Birliği (ACS) web sayfaları detaylı olarak incelenmiştir.

Bulgular: Yayınlanan kılavuzlara göre, elektif kanser cerrahisinden önce neoadjuvan kemoterapi tercih edilmektedir. Araştırmalar ayrıca hastaların ameliyattan önce mutlaka virüs RNA'sının varlığının tespiti için test yapılması gerektiğini göstermektedir. Ameliyathanede gerekli önlemlerin alınması çok önemlidir. Ameliyat sırasında, laparoskopik mi yoksa geleneksel yöntemlerin mi tercih edileceği tartışmalıdır.

Sonuç: COVID-19 küresel salgınında, malignitesi olan hastalar için cerrahi prosedürlerin seçimi, ameliyat öncesi ve sonrası yönetimi daha da önem kazanmıştır. Ancak hala cerrahi yöntemleri, patolojik sorunları ve yeni kılavuzların etkinliğini açıklığa kavuşturmak için daha fazla araştırmaya ihtiyaç vardır.

Anahtar Kelimeler: COVID-19, cerrahi, meme cerrahisi, endokrin cerrahisi, gastrointestinal cerrahi, hepatopancreatobilyer cerrahi

INTRODUCTION

Coronaviruses are a family of viruses with a broad spectrum of diseases from mild respiratory tract infections to severe respiratory distress even death. It has four main subgroups; alpha, beta, delta and gamma. The main coronavirus infections spread from animals to humans causing severe infections and death are SARS, MERS and COVID-19. The first laboratory supported COVID-19 diagnosis was made on January 2, 2020. COVID-19 is included in a family of beta coronaviruses and mainly holds the respiratory tract causing severe symptoms and sometimes resulting in acute respiratory failure and death. The World Health Organization (WHO) declared on January 31, 2020, COVID-19 as an international infectious threat. The known worldwide mortality rate of COVID-19 is 5.4% to date (1). After the symptoms begin, death is seen between 6-41 days and the median time to death in 14 days (2).

The disease is mainly caused by the contact of infected people through droplets, by touching their hands to mucous membranes of the mouth, eyes and nose after touching the surfaces. Although the infectious period is not exactly known, the incubation period is known as 5-6 days (3,4). It can be directly transmitted from person to person. The most obvious symptoms are fever, cough, weakness, dyspnea, headache and diarrhea. While it was more prominent with lung involvement first, now gastrointestinal tract findings are more prominent (4).

When looking at the current Turkey's COVID-19 data, to date a total of tests made is 4403031, the total number of infected patients is 222402 and 5545 people have died due to COVID-19 infection until today (5). Our total mortality rate is 2.49%. Considering the world COVID-19 mortality rates, Belgium comes first with 16.1%, followed by France and Italy with 15.2% and 14.5% respectively, while the USA mortality rate is 5.4% (1). Turkey has one of the lowest mortality rates across the globe. This is explained by the high number of a young population, as well as the good coordination between the Turkish Ministry of Health, hospitals and health workers and also the early start of the main drugs. Although these high mortality rates led us to postpone non-urgent treatments and surgical procedures to decrease the hospital admissions rather than COVID-19 infections, because of the obscurity of how long this pandemic would continue, routine health care services, routine follow-ups, screening and surgical procedures had to start again with high precautions. Though, the important question is "How should the surgical procedures be, preparing the surgical patients and what surgeries should be given priority in our new normal with the COVID-19 pandemic?"

There were many guidelines published by international organizations during the pandemic period on elective and emergency surgical procedures. The most important point here was to decide whether surgery is essential for patients or not?

The American College of Surgeons (ACS) has published recommendations for the management of elective surgical procedures. According to this guideline, they recommend that all hospitals and surgeons review their scheduled patients for surgery, endoscopy or other interventional procedures and postpone or cancel the procedures to minimize the hospital admissions, use of essential items, personal protective equipment, hospital beds and intensive care unit beds. They advise to reschedule elective surgeries if necessary and prepare patients for surgery in outpatient settings for diagnostic tests and presurgical preparation. Therefore, they advise the limitation of visitors to hospitals, separation of care areas of COVID-19 patients from others, including ward beds, intensive care unit (ICU) beds, also the segregation of treatment staff and healthcare workers and necessary equipment (6,7). ACS also recommends that cancer surgeries should be evaluated in multidisciplinary tumor boards, postponed if it is possible, evaluated whether there is non-surgical

treatment option, evaluation of patients' need for ICU beds after surgery, evaluation of hospital facilities and COVID-19 density and preferences of hospitals with low COVID-19 density and with necessary hospital facilities (8-10).

ACS, American Society of Anesthesiologists, The Association of Perioperative Registered Nurses and American Hospital Association recommends that elective surgeries should only be initiated if there is a decrease in the number of cases for at least 14 days in the area, if there are enough hospital facilities, ICU beds, ventilators, protective equipment and adequate healthcare workers to treat all non-elective cases without causing a crisis (11,12).

According to the above criteria, if we assume that the number of COVID-19 cases has not decreased yet, then what kind of surgery should we perform in general surgical practice?

BREAST SURGERY

The COVID-19 pandemic breast cancer consortium according to the expert opinion of representatives from multiple cancer care organizations categorizes breast cancer patients into 3 priority levels (A, B, C). Priority A is life-threatening condition, clinically unstable patients and patients with worse prognosis even if there is a short delay in treatment. These are septic patients with breast abscess and hemodynamically unstable patients with enlarging hematoma. Priority B is a condition that should not be delayed until the end of the pandemic. Most breast cancer patients are in priority B category. If the pandemic does not allow the treatment of breast cancer patients than these patients can wait for about 6-12 weeks. Priority B category includes three subcategories (B1, B2, B3). B1 patients have higher priority like ischemia of autologous flaps needing urgent revascularization or removal of flap and patients who have completed neoadjuvant chemotherapy for inflammatory breast cancer or triple-negative or human epidermal growth factor receptor 2 (Her 2)-positive breast cancer. B2 patients have a mid-level priority like patients finishing neoadjuvant chemotherapy or progressing disease during chemotherapy. B3 patients have lower priority than patients with clinically stage 2 or N1 with estrogen-receptor (ER)+/HER2- breast cancer or discordant biopsies likely to be a malignant or suspected local recurrence. Priority C category includes the patients who can definitely wait until the pandemic is over like patients with ductal carcinoma in situ (DCIS), high risk lesions, positive margins for invasive cancer, clinical stage 1 ER+/HER2- breast cancer patients (13,14). The Society of Surgical Oncology (SSO) supports that treatment decisions should be made on a case-by-case basis. According to SSO, surgery of patients with high-risk lesions can be deferred for at least 3 months. DCIS patients according to ER status can be delayed. ER positive DCIS patients can be treated with endocrine treatment for 3-5 months. If the patient has ER negative DCIS or large volume DCIS or DCIS with microinvasion then they should be re-evaluated every 4 weeks depending on health condition, these patients have high priority for surgery (15).

ER positive invasive breast cancer patients can be treated with neoadjuvant endocrine therapy for at least 3-5 months, triple-negative or HER2 positive patients should be treated with neoadjuvant chemotherapy. If the patients are post neoadjuvant, surgery should be delayed for 4-8 weeks. However, patients with a progressive disease should be considered for urgent surgery (15). After surgery, radiotherapy can be delayed, and endocrine treatment can be started. In addition, use of hypofractionated regimens should be considered to reduce hospital visits. All guidelines agree with no surgery for benign conditions and delaying risk reducing surgery until the COVID-19 became overwhelming (16-18). Most importantly, for patients with invasive cancer, a multidisciplinary tumor board may decide, case by case, to proceed with surgery.

In Turkey, breast centers only operate on urgent patients who have progression during chemotherapy or sarcoma or malignant phyllodes tumors during this period. ER positive breast cancer patients were directed to neoadjuvant endocrine therapy, triple-negative or HER2-positive breast cancer patients were directed to neoadjuvant chemotherapy and patients with post neoadjuvant treatment waited for about 4-8 weeks until suitable conditions become available (19).

ENDOCRINE SURGERY

According to the SSO resources most endocrine surgeries can be delayed during a pandemic. Endocrine conditions needing urgent surgery were; thyroid cancer with life-threatening local invasion or aggressive biology, severely symptomatic Graves' disease, goiter with highly symptomatic conditions and an open biopsy needed to diagnose anaplastic cancer or lymphoma. Therefore, hyperparathyroidism with life-threatening hypercalcemia that cannot be controlled by medically, adrenocortical cancer, pheochromocytoma or paraganglioma that cannot be controlled medically should also be treated with urgent surgery (20-22).

British Association of Endocrine and Thyroid Surgeons (BAETS) and American Association of Endocrine Surgeons (AAES) published their recommendations about adrenal surgery and they recommend that conditions with adrenocortical cancer, indeterminate masses >6 cm with suspicion for malignancy or medically refractory endocrine disorders, patients should undergo urgent adrenal surgery (21,23,24). For neuroendocrine tumors, all elective procedures should be postponed and only if medically refractory hormonally active disease, then surgery is indicated (25).

According to BAETS and AAES, differentiated thyroid cancer patients whose cancer is local to the thyroid gland without an extension of extrathyroidal involvement and compressive symptoms can wait for surgery for about 3-6 months (26,27). For medullary thyroid cancer, the extent of the disease should be considered and the surgery should be planned as soon as possible under appropriate conditions (22,28). Prophylactic surgery should not be postponed. If the surgery is postponed, patients should be carefully monitored with calcitonin levels (22). All benign conditions with controlled symptoms can be postponed during a pandemic.

GASTROINTESTINAL SURGERY

The European Society of Medical Oncology (ESMO) divides patients into 3 groups according to the patients' conditions, urgency of oncologic surgery and COVID-19 status. High priority conditions that are clinically unstable, life-threatening, or require immediate palliative treatment due to severe symptoms. Medium priority conditions that are serious but can wait for a short while, however, should not wait more than 6-8 weeks. On the other hand, low priority conditions can wait safely during COVID-19 pandemic (29). All conditions should be decided by a multidisciplinary tumor board.

In T1 gastric and esophageal cancer surgery is indicated, however in T2 or more or lymph node positive disease patients should undergo neoadjuvant chemotherapy, if any obstruction or a hemorrhage emergency surgery is indicated. Patients with clinical cT1N0 are considered for endoscopic resection according to ESMO guidelines and are also high priority. In other words, these patients must undergo endoscopic resection without waiting. Patients who will benefit from a stent or endoscopic gastrostomy for feeding tube are also high priority. Patients with high suspicion of esophageal/gastric cancer diagnosis who are unstable with bleeding or severe dysphagia are also in high priority group. Only in a very small group of less aggressive tumors, can wait for a short time. In addition,

staging laparoscopy and symptomatic patients with inoperable primary or recurrent cancer requiring palliative surgery are in medium priority group (29,30).

In colorectal cancers, if there is intestinal obstruction, bleeding or perforation due to a tumor, non-responded tumor to neoadjuvant treatment and early-stage tumor, which is not eligible for neoadjuvant treatment, should undergo surgery. Locally advanced tumors should be considered for neoadjuvant therapy and after neoadjuvant therapy patients should wait for 12-16 weeks. Moreover, clinical I, II and III colon cancer, clinical stage I rectal cancer, clinical stage II-III rectal cancer after neoadjuvant treatment and resection of metastasis in oligometastatic patients with curative intent are in medium priority group. New guidelines have recommended undergoing a one-week short course of radiotherapy and delaying surgery as the best way to treat patients with early-stage rectal cancer. Patients with postsurgical complications or post-colonoscopy complications also have high priority for surgery. Benign colorectal polyps or risk-reducing surgery should be deferred (31,32).

HEPATO-PANCREATO-BILIARY SURGERY

Asymptomatic pancreatic or duodenal neuroendocrine tumors, asymptomatic gastrointestinal stromal tumors (GIST), asymptomatic adenomas with high-grade dysplasia, hepatic adenomas, gall bladder polyps, choledochal cysts should be deferred for surgery. Tumors with obstruction or bleeding, hormonally active neuroendocrine tumors, surgical complications and all symptomatic or asymptomatic resectable duodenal, hepatic, gall bladder and pancreatic cancers should undergo surgery. Resectable pancreatic cancer (primary or after neoadjuvant treatment) and endoscopic placement of biliary stent in case of biliary obstruction in non-resectable or metastatic pancreatic cancer or in resectable cancer with active cholangitis are high priority cases. However, hepato-jejunostomy in biliary obstruction cases is medium priority. Surgical intentions are high priority for hepatocellular carcinoma (HCC) patients with large or multifocal but still curatively resectable lesions. On the other hand, curative resection of small single HCC lesions and curative ablation of small single HCC lesions are medium priority (30,33). Though listing patients for liver transplantation with poor short-term prognosis and curatively resectable hepatocellular cancers and pancreatic cancers also have high priority for surgery (33,34).

PREOPERATIVE EVALUATION OF PATIENTS IN THE OUTPATIENT SETTINGS

With the COVID-19 pandemic, some differences emerged in the routine surgical planning of patients before surgery. Detailed anamnesis, physical examination, biochemical tests, microbiological and radiological examination of the patient should be performed to determine whether the patient is infected before the operation. However, in cases where an urgent surgery is required, there may be differences in the evaluation of the patient. Personal protective equipment (PPE) must be used by the doctor and the patient during the examination. The patient's history of contact with cases suspected / confirmed to be infected with COVID-19 in the past 14 days should be questioned. Physical examination should be done as routine standards, but it is recommended to check the patient's fever before the examination. Apart from the standard surgical consent form, a consent form for COVID-19 should also be obtained. Moreover, the patient should be informed about COVID-19.

The real-time polymerase chain reaction (RT-PCR) test is the gold standard in the diagnosis of COVID-19 and should be performed in the preoperative period. The sensitivity of this test is between 37% and 71% in clinical practice. Repeated samples with an interval of 24-48 hours are recommended in cases of suspected infection with negative test results. The reasons for false negative results may be

related to insufficient sampling, sample type, transport, and to take the sample at a very early or late period of infection. Low PCR test sensitivity and difficulties in testing have increased the use of direct radiography and computer tomography (CT) in the evaluation of patients. Thorax CT is frequently preferred because of its high specificity of 93-100% and moderate sensitivity of 72-94%. Compared to the PCR test result, thorax CT diagnosed pneumonia in 67% of virus-negative cases and 94% of positive patients. For this reason, it appears that thoracic CT is also preferred before the preoperative evaluation of patients in Turkey.

Routine biochemistry tests, PCR test and thorax CT are recommended before all surgical procedures and surgical planning should be done in elective cases according to the results, except for emergency cases. In addition, protective measures should be applied, even if the patient's test results are negative. Even if the test results are negative, the patient still has a risk of carrying SARS-CoV-2 virus and the patient should be informed about this.

OPERATING ROOM

Because of the COVID-19 pandemic, all patients should be considered suspect, and therefore disease and infection control measures should be applied before, during and after surgery. The patient should be transferred with a surgical mask. It is important to transfer the patient to the operating room as quickly as possible, with minimal contact with the hospital environment and other people. Recent literature stresses that virus could remain viable in aerosols throughout three hours. For this reason, the numbers of staff should be minimized, and all additional staff should wait outside the operating room. Live viruses can be detected on surfaces up to 72 hours. Consequently, unnecessary items should not be brought to the operating room; this also includes personal items such as cell phones. The surgical team, who comes in contact with a critical patient (confirmed or suspected SARS-CoV-2 infection), must additionally use a properly tested N95 respirator mask, eye protection, full-face cover, liquid-resistant apron, long boots, and rubber gloves. Full-face cover may limit the use of a surgical microscope, DaVinci console or surgical loupes, thus surgeons should try to use these devices before the surgery.

It is highly recommended to avoid performing surgery for educational purposes in the pandemic. Preferably, an experienced surgeon should perform the surgical procedure, so that the operation time will be shortened, and the risk of complications will decrease.

The surgical procedure to be applied to patients is still controversial. Since the number of cases in studies comparing laparoscopic or traditional methods is low, it is difficult to draw conclusive results according to this data. A possible cause of contamination during laparoscopic surgery is related to the aerosol effect of the gas. On the other hand, in traditional surgical methods, the surgical team is in more contact with the patient's tissue and fluids and this increases the risk of infection.

Another issue of obvious concern is how to dispose of intraoperative and postoperative patient fluid and tissues (including aspirator content, organs, feces, urine, surgical materials used). In addition, it is also not clear how to send tissue samples to pathology and how to store the preparations. Currently, it is recommended to continue standard practices for these.

CONCLUSION

Since the first COVID-19 cases were diagnosed, various changes have been made in the health care system and new guidelines have been published to adapt to the pandemic. During this period,

neoadjuvant therapies became more important and elective surgeries are delayed to a later date. We will see their clinical implications in future studies. Further research is also imperative to improve our understanding of surgical methods and pathology.

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